Remarks

The Office Action of January 29, 2003, has been carefully considered. In response thereto, claims 1-13 have been amended, and new claims 14-40 have been added. Claims 1-40 remain in the application for further prosecution on the merits.

Claim 1 is now drawn to a method of making a polymer composite building material comprising (a) providing a reinforcement precursor, including commingled, continuous filaments of glass fibers and polymeric fibers; (b) consolidating said commingled, continuous filaments of glass fibers and polymeric fibers, such that said polymeric fibers become a matrix which is reinforced by said glass fibers, and (c) disposing a capstock polymeric layer substantially over said consolidated glass fibers and matrix; said capstock polymeric layer being resistant to heat deformation and corrosion.

Providing a reinforcement precursor including commingled, continuous filaments of glass fibers and polymeric fibers is disclosed on page 3, lines 10-20 of the specification. Consolidating the commingled, continuous filaments whereby the polymeric fibers become a matrix is disclosed at the same location. A capstock polymer for covering the reinforcement is disclosed on page 3, lines 5-10. Such disclosure also supports new independent claims 14-23, 29 and 38. Resistance to chemical gasses and acids is disclosed on page 2, line 10 of the specification. Resistance to heat deformation is disclosed at page 2, lines 6-7. No new matter has been added.

Each of the Examiner's objections or rejections is addressed below in the order they were presented in Paper No. 3.

Rejection Pursuant to 35 U.S.C. §112 Second Paragraph

In the Office Action of January 20, 2003, claim 7 was rejected pursuant to 35 U.S.C. §112, Second Paragraph, as being indefinite for failing to particularly point our and distinctly claim the subject matter. The term "and/or" in claim 7 was deemed indefinite.

Applicants have now amended claim 7 to recite "include carbon fibers, aramid fibers, or both", and believe that this claim is now definite and clear.

Rejection Pursuant to 35 U.S.C. §102(b) and §102(e)

On pages 2-5 of the Office Action, the Examiner rejected claims 1-9 and 11-13 under 35 U.S.C. §102(b) as being anticipated by Novich et al., '305. Claims 1-5, 8-9, and 11-13 were rejected under §102(e) as being anticipated by Fletemier et al., '682. Claims 1-9 and 11-13 were rejected under §102(b) as being anticipated by Woodside et al., '905.

Novich et al., '305, discloses a reinforced soil mixture including random oriented fibers, oriented in three dimensions. These strands are preferably discrete, in that they have an average length of about 5-500 mm, and are generally dispersed throughout the soil. Novich et al. teaches a soil matrix, and does not disclose a polymer composite, or method of making a polymer composite, for use as a building material as presently claimed. At col. 9, lines 20-23 of Novich et al., '305, they disclose a commingling of fibers of glass and organic polymer material.

Woodside et al., '905 discloses a protective covering for glass windows, which includes fiber reinforced, polymeric fabric, flexible enough to be rolled upon itself. The protective covering is formed from a plurality of reinforcing fibers and at least one polymeric material. The polymeric material may be in the form of polymeric fibers, which are commingled or combined with one or more reinforcing fibers, such as glass fibers, to form strands. As stated at col. 6, lines 4-15 of Woodside et al,

> the polymeric material of the strands are preferably melted and fused together only at localized areas so that the resulting fabric is flexible enough to be rolled upon itself. Substantially all of the matrix refers to the polymeric material from the strands being enough to provide a matrix for all the reinforcing fibers in the fabric. It does not preclude the use of additional matrix material from a source other then the strands.

Fletemeir et al., '682, discloses a laminated, panel-type structure suitable for vehicle interior applications, such as headliners and door panels. The laminated structure has superior sound attenuation properties resulting from a core of intertwined polyester fibers of differing deniers, which entrap air. The laminate also includes reinforcement layers which include chopped roving, such as glass fiber roving.

Rejection Pursuant to 35 U.S.C. §103(a)

On page 5 of the Office Action, claims 1, 8, 9 and 10 were rejected pursuant to §103(a) over Tucker et al., '325 in view of Novich et al., '305.

Tucker et al., '325, discloses plastic composites used for decking and fencing, wherein the reinforcing fibers include glass, graphite, aramid and polymeric fibers.

Tucker does not disclose that the polymeric fibers and the glass fibers are commingled, so the Examiner has added the disclosure of Novich for providing commingling of organic and inorganic fibers.

The Claimed Inventor

The present invention, as reflected in method claim 1, includes the steps of (a) providing a reinforcement precursor including commingled, continuous filaments of glass substantially oriented in at least a first direction and polymeric fibers; (b) consolidating said commingled continuous filaments of glass and polymeric fibers such that said polymeric fibers become a matrix which is reinforced by the glass fibers, and (c) disposing a capstock polymeric layer substantially over the consolidated glass fibers and matrix; said capstock polymeric layer being resistant to heat deformation and corrosion. Newly added independent claim 14 is directed to a composite building material including a composite reinforcement containing continuous filaments of fibers substantially oriented in at least a first direction within a polymeric matrix and a capstock polymeric material disposed over the composite reinforcement, wherein the building material is resistant to heat deformation and corrosion. Claim 23 is directed to a polymeric composite fencing component including a composite reinforcement comprising continuous filaments of high strength fibers oriented substantially in at least a first longitudinal direction

within a polymeric matrix and a capstock polymeric material disposed substantially over the composite, in which the fencing component is resistant to corrosion and heat deformation due to exposure to sunlight. Claim 29 recites a method of making a polymer composite building material comprising forming a composite reinforcement comprising continuous filaments of fibers oriented substantially in at least a first direction within a polymeric matrix, and disposing a capstock polymeric material substantially over the composite reinforcement. And claim 38 is directed to a polymeric composite building material which includes a composite reinforcement comprising continuous glass filaments of fibers substantially oriented in at least a first direction within a thermoplastic polymeric matrix and a capstock polymeric material having a dark color disposed substantially over said composite reinforcement, the building material being resistant to chemical gases or acids and also resistant to bowing due to expansion and contraction of the building material upon exposure to sunlight.

The References Do Not Suggest or Anticipate the Claimed Invention

Novich '305 does not teach or suggest any of the presently claimed methods, building materials or fencing components. Novich teaches a soil matrix which can be reinforced with random oriented fibers. It does not teach a polymeric matrix, as required by the composite reinforcement of applicant's claims, and does not provide a capstock polymeric material. Novich '305 also fails to teach a product which is resistant to heat deformation and corrosion as recited in claims 1, 14, 21, or one which resists chemical gases and acids as well as bowing due to expansion and contraction when exposure to sunlight as recited in claim 38. Accordingly, reconsideration of the Examiner's rejection pursuant to subsection 102(b) in view of Novich '305 is respectfully requested.

Woodside et al., '905 also fails to anticipate applicants' pending claims. The Woodside protective covering for glass windows is a roll-up shade and is not a composite building material or fencing component. While Woodside does not preclude the use of additional matrix material from a source other than the polymer strands in their fabric, there is no disclosure of a capstock polymeric material being disposed substantially over the reinforcement

as required in claims 1, 14, 21, 29 and 38. Moreover, Woodside et al. states that the polymeric material of the strands is preferably melted and fused together only at localized areas so that that the resulting fabric is flexible enough to be rolled upon itself as described. Col. 6, lines 7-10. This does not suggest that the commingled continuous fibers are consolidated such that the polymeric fibers become a matrix which is reinforced by the glass fibers, as required in claim 1, for example. Moreover, there is nothing in Woodside et al. to suggest that his shade is resistant to heat deformation and corrosion, as required in claims 1, 14, and 23, or is resistant to chemical gases, acids or bowing as required in claim 38. In fact, it is difficult to imagine a shade fabric that is not meant to bow or deform. Accordingly, reconsideration of rejection under subsection 102(b) in view of Woodside et al., '905 is respectfully requested.

Fletemier et al. '682 also fail to anticipate the pending claims. Fletemier et al. teach a laminated acoustical panel for vehicle interiors such as headliners in doors, and does not constitute a building material for the commercial house or residential building trade. There is no suggestion in Fletemier for consolidating commingled continuous filaments of glass fibers substantially oriented in at least and polymeric fibers such that the polymeric fibers become a matrix and the glass fibers become the reinforcement of a composite which is subsequently substantially covered over by a capstock polymeric layer, so that the product is resistant to heat deformation and corrosion, as in claim 1, nor does this reference teach or suggest a composite reinforcement comprising continuous filaments of fibers substantially oriented in at least a first direction within a polymeric matrix followed by a capstock polymeric layer in which the building material or fencing component is resistant to heat deformation and corrosion, as in claims 14 and 23, nor does it suggest a method of forming a polymeric composite building material in which the composite reinforcement is formed from continuous filaments of fibers oriented substantially in at least a first direction within a polymeric matrix followed by disposing a capstock polymeric material substantially over the composite reinforcement as in claim 29. Nor does this reference teach or suggest a polymer composite building material including continuous glass filaments of fiber substantially oriented in a least a first direction within a thermal plastic polymeric matrix followed by a capstock polymeric material having a dark color

disposed substantially over the composite reinforcement in which the material is both corrosion resistant to chemical gases and acids and resistant to bowing as in claim 38. Accordingly, reconsideration of the Examiner's rejection of the claims the pending claims in view of Fletemier et al. is respectfully requested.

Finally, the combination of Tucker '325 in view of Novich et al. fails to teach or suggest applicant invention under § 103. The proposed combination provided by the Examiner represents technologies from two different fields, Novich '305 being in the soil reinforcement field, and Tucker '325 being in the field of nail packs. There is no reason to suggest that one artisan looking for a solution to the heat deformation and corrosion problems associated with composite building materials would even look to soil reinforcements or nail packs in the first instance, and one would further wonder how someone from the soil reinforcement field would be working with someone from the nail pack industry as the proposed combination implies. Accordingly, the rejection of applicant's pending claims in view of the combination of Novich '305 and Tucker et al. '325 appears to be lacking a prima facie foundation.

More specifically, however, there is nothing in the proposed combination that would teach either the methods of claims 1 and 29 nor the products of claims 14, 23 or 38. As stated earlier, Novich '305 teaches random oriented fibers which are not substantially oriented in a least a first direction within a polymer matrix as required by claims 14, 23, 29 and 38, and Tucker et al. '325 discloses composite nails which fail to suggest fibers substantially oriented in at least a first direction or a building material which is resistant to heat deformation, bowing, and/or corrosion. In addition, the method of claim 1 is not suggested by the proposed combination since there is no teaching for the consolidation of commingled continuous filaments of glass fibers and polymeric fibers into a solid matrix followed by substantially covering the glass fibers and polymer matrix composite reinforcement with a capstock. In view of the above, reconsideration of the Examiners rejection pursuant to §103 is respectfully requested.

The dependent claims also appear patentable:

The references of record also fail to anticipate, or render obvious, the features of applicant's dependent claims. For example, there is no suggestion in any of the references for modifying applicants' method of making a polymer composite building material, as recited in claim 1, by consolidating the commingled fibers *in-situ* during in-line extrusion or pultrusion of the final end product, as recited in claim 2, or by consolidation of commingled fibers to produce a tape or rod, as recited in claim 3, or a disposing step comprising extrusion, as in claim 4, or a consolidation step that comprises extrusion, pultrusion, or both, as in claim 5, or a commingled, continuous filament of glass and polymeric fibers in which the glass content is about 40 or 80 percent, as in claim 6, or commingled, continuous filaments of glass fibers and polymeric fibers which include, carbon or aramid fibers, as in claim 7, or a reinforcement precursor which includes bulk molding compound made of the commingled, continuous filaments of glass fibers and polymeric fibers, as in claim 8, or a consolidating step which includes compression molding as in claim 9, or a method of making building products, which a building product includes a fence, rail, post, or deck material, or helically winding glass fibers and polymeric fibers, or both as in claim 11, or the step of blending polymeric pellets until one achieves glass fiber content of 10 percent or greater, as in claim 12, or a method of making a building product which has controlled thermal expansion and contraction characteristics, as in claim 13.

Moreover, there in no teaching or suggestion for dependent claims which require a dark color capstock, claim 15, resistance to bowing due to expansion and contraction when exposed to sunlight, claim 16, a composite reinforcement and capstock which are observably discrete portions of said building material, claim 17, or a building material which is resistant to corrosion including chemical gases and acids, as in claim 20, or a fencing component having a fabric comprising a uni-directional, multi-axial or woven material, as in claim 25, or a pultrusion, as in claim 26, or a polymeric matrix comprises a thermoplastic resin, as in claim 27, or a fencing component having a dark color and span of at least 8 feet, as in claim 28. Additionally, the additional steps of pultruding a commingled roving, as in claim 31, pultruding a commingled roving comprising continuous filaments of fibers and a fibrous precursor of the polymeric

matrix, as in claim 32, and pultruding commingled roving including glass fibers and polymeric thermoplastic fibers which represent the fibers precursor of the polymeric matrix, as in claim 33, or a disposing step comprising extruding the capstock polymer over the composite reinforcement, as in claim 34, or a combination of pultrusion and providing a capstock over a pultruded composite, as in claim 35, or conducting pultrusion and extrusion in-line, as in claim 36, or disposing fibers in both a first and a second direction, as in claim 37. Accordingly, reconsideration of the dependent claims is also earnestly requested.

Summary

In view of the above, reconsideration of this application is respectfully requested, and on early notice and allowance is earnestly solicited

Respectfully submitted,

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Enclosures:
Petition for a Two-Month Extension of Time, with fee
IDS, with fee